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A New Genus and Species of Plesiopid Fish from Western Australia and the Central-south Pacific Ocean

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Abstract

Steeneichthys plesiopsus is described as a new genus and species on the basis of 12 specimens collected between 1974 and 1983 at Rowley Shoals (off north-western Australia in the eastern Indian Ocean), Fiji Islands, and American Samoa. The species is distinct from other members of the family Plesiopidae in the possession of nine dorsal spines, a single tubed lateral-line scale, and by the absence of palatine teeth. The new genus is most closely allied to *Plesiops*.

Introduction

Rowley Shoals, lying approximately 320 kilometres west of Broome, Western Australia have been the focus of two biological expeditions from the Western Australian Museum. The Shoals are of special interest because of their isolated offshore position, diverse physiography, and huge tidal range which exceeds five metres. They consist of three roughly circular atolls, with diameters of about eight to 16 kilometres. The atolls are separated from each other by about 26 to 37 kilometres of deep oceanic water. Each has a vast central lagoon and extensive reef flats which are largely exposed during low spring tides. In July 1982, the senior author accompanied a biological team which mainly investigated corals, echinoderms, molluses, crustaceans, and fishes. Another two-week visit was made by the senior author in August 1983 with the Museum's Maritime Archaeology Department. In addition, B.C. Russell, Curator of Ichthyology at the Northern Territory Museum in Darwin collected fishes independently for two weeks on the same expedition. Allen and Russell plan to publish a future report on the overall fish fauna which contains approximately 500 species. This is the second paper in a series involving new taxa from Rowley Shoals (see Allen, 1983). It describes a new genus and species collected with the aid of SCUBA gear in relatively deep water of the steep outer reef slope. We also include 10 specimens of the new taxon which were collected at Tutuila, American Samoa and the Fiji Islands.

The new species is clearly a representative of the family Plesiopidae which Norman (1957) and Nelson (1976) characterise as a family of perciform fish with pelvic fins composed of one spine and four soft rays, three anal spines, and lateral-line in two parts. The family (prior to this study) contains about 17 species in six genera: *Paraplesiops* and *Trachinops* from temperate Australian seas; *Fraudella* from the Great Barrier Reef and coast of Queensland;

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Assessor from the tropical western Pacific (mainly eastern Australia and Ryukyu Islands); *Plesiops* and *Calloplesiops* from the tropical Indo-western Pacific region. They range in size from the diminutive *Assessor* (about 50mm SL) to *Paraplesiops* which reaches a maximum of about 40cm SL. Most of the species are cryptic dwellers of dark caverns and ledges.

Type-specimens have been deposited in the collections of Bernice P. Bishop Museum, Honolulu (BPBM), Royal Ontario Museum, Toronto (ROM), United States National Museum of Natural History, Washington, D.C. (USNM), and Western Australian Museum, Perth (WAM).

Systematics

Steeneichthys gen. nov.

Type-species, *Steeneichthys plesiopsus* Allen and Randall.

Diagnosis

A genus of Plesiopidae differing from other members of the family on the basis of the following combination of characters: nine dorsal spines (other genera with 10 to 15 spines, usually 11 or more); only a single lateral-line scale with sensory tubule (other genera with well developed lateral-line, usually in two series); soft anal rays 7 (other genera with 8 to 23 rays, although *Plesiops* occasionally with 7 rays); total gill rakers on first arch 11 (other genera usually with 13 to 31, except one species of *Plesiops* with 9 to 15); dentary lip fold not interrupted by isthmus; colour generally mottled brown with series of distinct cross-bands on head and body; habitat consists of caves and crevices of outer reef slopes in 15 to 36 m depth.

Description

As for the single known species, *S. plesiopsus* (see below).

Remarks

Hoese and Kuiter (1984) presented a table comparing the six genera of Plesiopidae including *Assessor, Plesiops, Paraplesiops, Fraudella, Calloplesiops*, and *Trachinops*. Utilising the same features given by these authors *Steeneichthys* is characterised by: (1) no teeth on tongue, (2) teeth present on vomer, (3) maxilla scaleless, (4) head not scaled forward to snout, (5) preopercular margin smooth, (6) second dorsal base scaled, (7) pores on preopercular confined to margin and hidden by scales, (8) dorsal spine membranes deeply incised, (9) a single, exposed lateral-line pore, (10) gill rakers on first arch relatively short, (11) scales with distinct centres and radiating lines, (12) outer row of jaw teeth not enlarged, (13) caudal fin rounded, (14) dorsal spines 9, (15) dorsal rays 8 or 9, (16) anal rays 7, (17) pectoral rays 17 or 18, (18) a single scale in upper lateral-line, and (19) lower lateral-line scales absent.

Steeneichthys appears to be most closely related to the genus *Plesiops* Cuvier which was reviewed by Inger (1955). The group contains five known species which are confined to the tropical Indo West Pacific. Superficially the two genera greatly resemble each other, but there are significant differences related to dorsal spine count, head pore pattern, structure of the lateral-line system, and palatal denition. *Plesiops* usually has 11 or 12 (rarely 10 or 13)

dorsal spines compared with nine spines for *Steeneichthys*, which is the lowest count in the family (other species 11-15). In addition, *Plesiops* is characterised by numerous small sensory pores on the head. For example, those of the postorbital-interorbital may number between 50 and 100, in vivid contrast to only three pores in this region on *Steeneichthys*. The latter genus also differs from *Plesiops* and other plesiopids by having a continuous lip fold across the front of the lower jaw (i.e. not interrupted by isthmus). The lateral-line system of *Steeneichthys* is unique in the family. Other species are characterised by a well defined row of tubed scales, sometimes divided into two parts, an anterior series on the upper side and posterior series along the side of the caudal pedunele. By contrast, *Steeneichthys* has the lateral-line represented by a single tubed scale positioned above the dorsal margin of the operculum. Moreover, the new genus differs from all other plesiopids in the absence of palatine teeth. It also has a lower gill raker count for the first branchial arch than other members of the family except *Plesiops coerulolineatus* which has a range of 9 to 15 (usually 11 to 13).

The genus is named *Steeneichthys* in honour of Roger C. Steene of Cairns, Queensland who has greatly assisted the authors on numerous expeditions in the Indo-Pacific region, usually at his own expense. Mr Steene also helped with the collection of the holotype of *S. plesiopsus*.

Steeneichthys plesiopsus sp. nov.

Figures 1 and 2; Table 1

Holotype

WAM P28031-018, male, 24.6 mm SL, outer reef slope 4 km west of Bedwell Island, Clerke Reef, Rowley Shoals (approximately 17°18′S, 119°19′E), in 35 m depth, rotenone, G. Allen and R. Steene, 11 August 1983.

Paratypes

BPBM 17524, 2 specimens, 17.3-25.8 mm SL, west side of Tapisi Point on north shore of Tutuila, American Samoa, in 27 m depth, rotenone, J. Randall and R. Wass, 9 May 1974; BPBM 20012, 3 specimens, 23.8-28.9 mm SL, Tutuila, American Somoa, in 18 m depth, rotenone, R. Wass and G. Yamasaki, 31 October 1975; BPBM 24110, 2 specimens, 21.1-25.0 mm SL, off Aua Village, Tutuila, American Samoa, in 15 m depth, rotenone, R. Wass, 31 October 1975; ROM 46183, 2 specimens, 25.0-26.4 mm SL, Kadavu, Fiji Islands (approximately 18°45.5′S, 178°30.5′E), in 0.5-3 m depth, rotenone, R. Winterbottom *et al.*, 30 March 1983; USNM 24218, 25.3 mm SL, Charybdis Reef, Fiji Islands (approximately 17°12′S, 178°00′E), in 30-36 m depth, rotenone, V. Springer *et al.*, 29 May 1982; WAM P28027-005, 17.6 mm SL, outer reef slope 2 km SE of Bedwell Island, Clerke Reef, Rowley Shoals (approximately 17°16′S, 119°22′E), in 33-36 m depth, rotenone, G. Allen and R. Steene, 8 August 1983.

Description

The range of paratypes is indicated in parentheses if different to the holotype. Dorsal fin rays IX,9 (8 or 9); anal fin rays III,7; pectoral fin rays 17 (17 or 18); pelvic fin rays I, 4; branched caudal fin rays 16 (14 to 16). Scale rows form origin of lateral-line to base of caudal fin 22 or 23 (23 or 24); a single lateral-line scale with sensory tubule above upper edge of operculum; transverse scale series, counted forward and upward from the second anal spine 9 (9 or 10); predorsal scales 7 (6 or 7). Gill rakers on first arch 3 + 8 = 11 (2 or 3 + 7 or 8 = 10 or 11); vertebrate 10 + 15 = 25; predorsal bones 3.

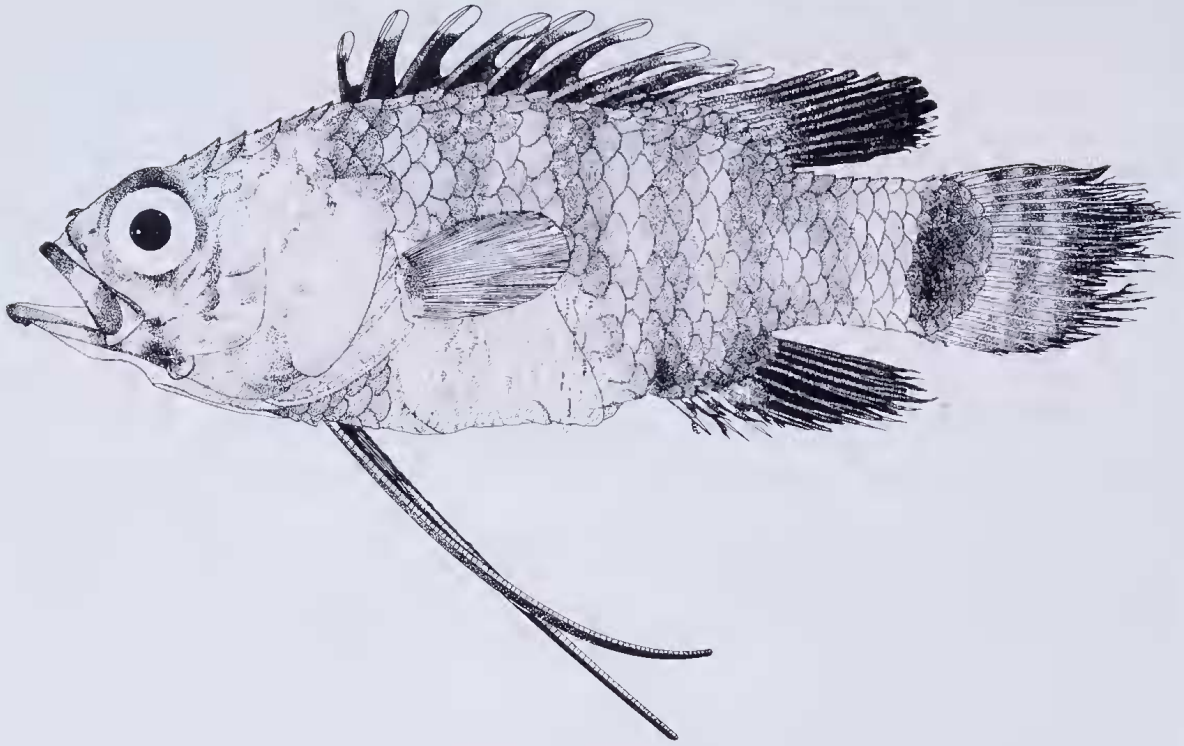

Figure 1. *Steeneichthys plesiopsus* n. sp., male, holotype, 24.6 mm S.L., Rowley Shoals, Western Australia.

Figure 2. *Steeneichthys plesiopsus* n. sp., paratype, 25.8 mm SL, American Samoa.

Table 1: Fin-ray and gill raker counts for type specimens of *Steeneichthys plesiopsus*.

Soft dorsal rays		Pectoral rays	
8	9	17	18
2	7	4	5

Branched caudal rays			Gill rakers on first arch	
14	15	16	10	11
1	3	5	5	4

The following measurements are expressed as percentages of SL. Head length 42.7 (38.4-44.0); snout length 6.1 (4.9-6.8) maxilla length 15.9 (14.9-18.6); orbit diameter 13.0 (12.5-15.2); depth at first dorsal spine 37.0 (31.3-40.1); predorsal distance 38.3 (37.6-41.9); preanal distance 64.4 (63.6-71.2); least depth of caudal peduncle 17.5 (15.8-18.9); pectoral fin length 22.4 (18.2-23.5); length of longest pelvic fin ray (damaged in most specimens) 47.6 (21.3-56.2); dorsal fin base length 55.2 (44.0-53.8); anal fin base length 18.7 (18.2-23.3); caudal fin length 28.5 (27.7-30.0).

Head and body moderately compressed. Jaws nearly equal anteriorly; maxilla reaching posteriorly to below middle of eye; cleft of mouth oblique. Scales on head and body ctenoid (however, most of head scales missing on type specimens). Snout, preorbital and anterior part of interorbital area, chin and maxilla naked. Upper part of operculum, edge of preopereulum, orbital and supraorbital region of head, lower jaw and snout bearing sensory canals; opercular and preopercular edge entire. Cephalic sensory pores as follows: three pores in supraorbital-postorbital series, four or five pores in lacrymal (preorbital) series, two enlarged pores in middle portion of ventral surface of each dentary, and four or five pores in preoperclular series; a fleshy flap of skin at tip of lower jaw tucked under lip fold and a pair of small papillae immediately behind skin flap; a cluster of low papillae between anterior and posterior nostril openings; anterior nostril opening composed of elongate fleshy tube positioned about one-half distance between anterior rim of eye and edge of upper lip; posterior nostril opening relatively large, positioned adjacent to anterior rim of eye.

Premaxillary and dentary dentition composed of tiny villiform teeth in dense band, with maximum width at symphysis of jaws; a narrow v-shaped band of villiform teeth on vomer; palatines toothless.

Holotype with four anteriormost soft dorsal rays and first anal soft ray unbranched; all soft rays appear unbranched in one paratype, but distal edge of fins damaged; first dorsal spine about two-thirds length of second dorsal spine; remaining spines gradually increasing in length posteriorly; soft dorsal rays slightly higher than spinous portion of fin; longest soft anal rays about twice length of longest anal spine; pectoral fins rounded, all rays branched except two uppermost and two lowermost; pelvic fin with anteriormost soft ray long and filamentous (damaged in holotype), all soft rays unbranched; caudal fin rounded; dorsal, caudal, and anal fins with scaly sheath at base.

Colour of fresh holotype (from Ektachrome transparency in files of WAM): generally mottled brown; head whitish with three golden-brown bars, first through eye, second just behind eye across preopereulum, and third ill-defined across operculum; iris golden; body

with series of six faint brownish cross-bars: first at rear edge of head, second just behind pectoral fin base, third at level of posterior edge of pectoral fin, fourth at level of anal fin spines, fifth at level of posteriormost dorsal and anal fin rays, and sixth across caudal peduncle; dorsal part of sides with small white specks; dorsal and anal fins mainly blackish, but whitish basally and with prominent white marginal band; caudal fin with broad dark brown bar at base, remainder of fin with alternating white and brown bands and white posterior margin; pelvic fins dark brown; pectoral fins translucent with diffuse brown spot covering base.

Colour in preservative: generally similar to fresh colouration, but overall darker brown and cross-bands on head and body scarcely discernible on holotype and most paratypes. One paratype, 23.8 mm SL (BPBM 20012), has pronounced alternating light and dark bars on the side of the body and a faint ocellus on the posterior section of the dorsal fin.

Remarks

The holotype and smallest paratype were collected at Rowley Shoals in 33 to 36 m from the base of a steep outer reef slope. Rotenone was distributed in several caves and ledges. Both specimens were found on rubble bottom, presumably having been flushed from crevices by the ichthyocide. The Samoan and one of the Fijian paratypes were taken in similar circumstances, but two specimens from Fiji were collected in very shallow water (0.5-3 m) on the sloping seaward edge of a fringing reef that consisted of consolidated limestone with caves and crevices fringed with sand-rubble bottom. The species is probably widespread in the Indo-West Pacific region, but has remained undetected because of its small size and cryptic habits. The gut of the holotype contained molluscan and crustacean fragments.

The species is named *plesiopsus* with reference to its similar appearance to members of the genus *Plesiops*.

Acknowledgements

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We also thank Dr Richard Wass for his help with the collection of the Samoan paratypes and Dr Richard Winterbottom (ROM) for sending us the Fijian specimens, which he independently recognised as a new genus and species. Dr Victor Springer (USNM) also contributed a specimen collected at Fiji. Roger Swainston of Perth prepared the excellent drawing of *Steeneichthys plesiopsus*. Finally, we thank Connie Allen and Jan Paniperis for their care in the preparation of the typescript.

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